S/186/61/003/001/018/020
A051/A129

Scintillation technique of counting ...

apparatus and Fig 2 shows the principal circuit of coincidences. The tubes of the apparatus are fed by stabilised sources of anode and incandescent voltage, and the photomultipliers by a ВС-9 (VS-9)-type high-voltage source. The positive pulses from the exits of two non-overloaded amplifiers are fed to the inputs of the diode low-level discriminators ($Л_2$, $Л_9$, in Fig 2). The limiting ($Л_1$, $Л_8$) diodes are used for eliminating the negative pulse outputs fed to the low-level discriminator inputs. The selected photomultiplier should satisfy the following requirements: 1) a high sensitivity of the photocathode, 2) a high total sensitivity, 3) a low noise level, 4) stability over long periods of service, 5) a good temporary resolving power. The adjustment of the counter for the C^{14} spectrum is carried out according to the γ-line of Cs^{137}. The discriminators of the lower level are installed so that the number of the noise pulses at the output of the circuit of coincidences would be equal to 0.5-1 pulses/min. The sample is counted in a 15.5 cm^3-volume cuvette made of optic quartzite. The preparation of ethylbenzene and benzene from the carbon of the investigated material involves the following chemical steps: 1) formation of CO_2 from the sample, 2) production of strontium carbonate from CO_2 of the sample, 3) reduction of the

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strontium carbonate to strontium carbide, 4) decomposition of strontium carbide, separation of acetylene from hydrogen and purification of acetylene, 5) synthesis of ethylbenzene from acetylene, 6) purification of ethylbenzene and benzene. The samples to be measured are carbonates or organic substances (coal, wood, peat, etc.). In both cases the carbon of the sample is separated out in the form of CO_2. The formation of CO_2 from the carbonate samples is performed by the decomposition of the sample with hydrochloric acid. If the investigated sample is an organic material, the formation of CO_2 is carried out by heating the sample in an oxygen flow. The single synthesis of large amounts of acetylene (up to 30 l) is carried out according to the Suess method (Ref 4), the main advantage of which is said to be the almost quantitative yield of acetylene (95%). The synthesis of ethylbenzene is carried out according to the method of hydroalkylation of benzene with acetylene in the presence of metallic Al, $AlCl_3$ and hydrogen chloride (Ref 16). The authors conducted a complete synthesis of benzene from the investigated material according to Reppe's method (Ref 13). The catalyst for the synthesis of benzene by the given method is a compound of a mixed type having both an organic as well as an inorganic nature: $Ni(CO)_2[P(C_6H_5)_3]_2$.

Card 5/8 6

The latter is produced by the interaction of nickel tetracarbonyl on an ether solution of triphenyl-phosphine at the boiling point of ether. Results of determinations of the absolute age of four samples are listed. A comparison of various methods is made. There are 2 tables, 6 diagrams and 21 references: 4 Soviet-bloc, 17 non-Soviet-bloc.

Figure 2: Principal circuit of coincidences
(1) - input
(2) - output
(3) - resistance
(4) - v(volt)
(5) - discriminator input of the upper level

(for Fig. 2 see card 8/8)

ZHARKOV, A.P.

Photomultipliers for time measurements. Trudy Radiev.inst,AN SSSR 9:281-285 '59. (MIRA 14:6)

(Photomultipliers)

STARIK, I.Ye.; ZHARKOV, A.P.

Rate of sediment accumulation in the Indian Ocean determined by radiocarbon dating. Dokl.AN SSSR 136 no.1:203-205 Ja '61.
(MIRA 14:5)

1. Chlen-korrespondent AN SSSR (for Starik).
(Indian Ocean--Sedimentation and deposition)
(Radiocarbon dating)

ZHARKOV, A.S., inzh.; NIKUL'SHIN, K.Ye., inzh.

New semitrailers with load capacities of 25 and 12.5 tons. Mekh.stroi. 14 no.6:9-11 Je '57. (MIRA 10:11)
(Motortrucks--Trailers)

ZHARKOV, A.S., inzh; NIKUL'SHIN, K. Ye.

Units for transporting and laying cable. Mont. i spets. rab. v stroi. 24 no.10:14-16 '62. (MIRA 15:10)

1. Tsentral'noye konstruktorskoye byuro Ministerstva stroitel'stva RSFSR.

(Electric cables)
(Conveying machinery)

PARAMONOVA, V.I.; ALTYNOV, V.I.; KOLYCHEV, V.B.; ZHARKOV, A.V.

Elution curves as a method of studying the state of matter in solution. Vest. LGU 15 no.16:74-79 '60. (MIRA 13:8)
(Ion exchange) (Niobium--Isotopes)
(Zirconium--Isotopes)

ZHARKOV, A.V.

Experience in organizing the storage and processing of vegetables at the "Bol'shevik" State Farm. Kons. i ov. prom. 15 no. 12:32-33 D '60. (MIRA 14:1)

1. Sovkhoz "Bol'shevik" Moskovskoy oblasti.
(Serpukhov—Canning and preserving)

PALILOV, N.A.; D'YACHENKO, V.S.; Prinimali uchastiye: MEZHVINSKAYA, T.B.; ZHARKOV, A.V.

Storability and quality of vegetables grown in flood plains. Biokhim.pl.i ovoshch. no.7:218-223 '62. (MIRA 16:1)

1. Nauchno-issledovatel'skiy institut ovoshchnogo khozyaystva. (Vegetables--Storage)

KARPOV, Fedor Andreyevich [deceased]; ZHARKOV, Aleksandr Vasil'yevich;
LEONOV, S., red.; POKHLEBKINA, M., tekhn. red.

[A vegetable "factory" of the Moscow region]Na podmoskovnoi
fabrike ovoshchei. Moskva, Mosk. rabochii, 1962. 125 p.
(MIRA 15:10)

(Serpukhov District--Vegetable gardening)

PARAMONOVA, V.I.; ZHARKOV, A.V.

Effect of the method used in making a preparation on the state of microquantities of niobium in nitric acid. Vest. LGU 16 no.4:116-125 '61. (MIRA 14:3)

(Niobium)

KARPOV, F.A.,; ZHARKOV, A.V., agronom

Using flood lands for the cultivation of vegetables. Zemledelie 7 no.5:48-53 My '59. (MIRA 12:7)

1. Direktor sovkhoza "Bol'shevik", Moskovskoy oblasti.
(Vegetable gardening) (Alluvial lands)

ZHARKOV, B.

Monopolies are on the offensive while the trade-union bosses maneuver. Sov.profsoiuzy 16 no.6:60-62 Mr '60. (MIRA 13:3)

(United States--Labor laws and legislation)

ZHARKOV, B.

At the altar of Moloch. Okhr. truda i sots. strakh. 4 no. 2:60-63 F '61. (MIRA 14:2)
(United States--Industrial accidents)
(United States--Collective labor agreements)

ZHARKOV, B., yurist

Squanderer of nerves and brain. Izobr. i rats. no.6:44-45 Je '61.
(MIRA 14:6)

(United States--Suggestion systems)

ZHARKOV, ~~B.L., kand.~~fiziko-matematicheskikh nauk

Characteristics of the motion of burning particles. Trudy TSNII MPS no.214:93-102 '61. (MIRA 14:8)
(Coal, Pulverized--Combustion)

ZHARKOV, B.L. kand.fiziko-matematicheskikh nauk

Test results obtained from experimental studies of the combustion process of heavy single drops of liquid fuels. Trudy TSNII MPS no.228: 5-18 '62. (MIRA 15:7)

(Combustion research) (Liquid fuels)

AKHMEDOV, R.B.; TSIRUL'NIKOV, L.M.; GORBANENKO, A.D.; ZHARKOV, B.L.

Experimental study of the dispersion characteristics of high-performance centrifugal sprayers. Izv. AN UzSSR. Ser. tekh. nauk 8 no.6:66-73 '64. (MIRA 18:3)

1. Institut ispol'zovaniya topliva Gosneftekhimkomiteta pri Gosplane SSSR.

ZHARKOV, B.L., kand. fiziko-matematicheskikh nauk

Effectiveness of the burning of mazut. Elek. sta. 36 no.1: 75-77 Ja '65. (MIRA 18:3)

1. Vsesoyuznyy ordena Trudovogo Krasnogo Znameni teplotekhnicheskiy institut imeni F.E. Dzerzhinskogo.

AKHMEDOV, R.B.; GORBANENKO, A.D.; ZHARKOV, B.L.; TSIRUL'NIKOV, L.M.

Flow ratio from centrifugal atomizers. Izv. AN Uz. SSR. Ser. tekh. nauk 9 no. 1:72-76 '65 (MIRA 19:1)

1. Institut ispol'zovaniya topliva Gosneftekhimkomiteta pri Gosplane SSSR.

TSIRUL'NIKOV, L.M., inzh.; GORBANENKO, A.D., kand. tekhn. nauk; ZHARKOV, B.L., kand. fiz.-mat. nauk

Study of small spray burners of high productive capacity.
Energomashinostroenie 10 no.11:27-29 N '64 (MIRA 18:2)

TSIRUL'NIKOV, L.M., inzh.; GORBANENKO, A.D., kand.tekhn.nauk; ZHARKOV, B.L., kand.fiz.-mat.nauk

Stability of the expenditure characteristics of centrifugal burners with high productive capacity. Teploenergetika 11 no.2:46-49 F '64. (MIRA 17:4)

1. Vsesoyuznyy teplotekhnicheskiy institut.

ZHARKOV, B. L.

"Investigating the Process of Combustion of Carbon in the Bubbling Layer of Enhanced Separation." Sub 21 Mar 51, Moscow Order of Lenin State U imeni M. V. Lomonosov.

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55.

ZHARKOV, B.L., kand.fiziko-matematicheskikh nauk; KIST'YANTS, L.K., kand.tekhn.nauk

Combustion of low quality fuels in a vortex combustion chamber with cooled metal walls. Trudy TSNII MPS no.214:71-92 '61. (MIRA 14:8)

(Gas turbines--Combustion) (Petroleum as fuel)

ZHARKOV, B.L., kand.fiz.-mat.nauk; KIST'YANTS, L.K., kand.tekhn.nauk

Combustion of low-grade liquid fuels in vortex-type chambers. Vest. TSNII MPS 20 no.2:18-22 '61. (MIRA 14:3)
(Liquid fuels) (Gas-turbine locomotives)

ZHARKOV, D.G.

Biology of the twenty-spotted leaf beetle (Melasoma vigintipunctata L.). Vest. Tbil. bot.sada no.69:135-136 '63. (MIRA 17:10)

Birds of the Tiflis Botanical Garden. Ibid.:137-141

ZHARKOV, D.G.

Tree of heaven in Tiflis and environs. Vest. Tbil. bot. sada. no.68:49-52 '62. (MIRA 17:5)

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VLADIMIRSKIY, V.V.; GRIGOR'YEV, V.K.; YERGAKOV, V.A.; ZHARKOV, D.P.; TREBUKHOVSKIY, Yu.V.

Electron-neutrino angular correlation in free neutron decay. Izv. AN SSSR. Ser. fiz. 25 no.9:1121-1123 '61. (MIRA 14:8)

(Neutrons--Decay)
(Neutrinos)
(Electrons)

ZHARKOV, D. V.

BEYLINA, TS.O., inzhener; BLAGONADEZHDIN, V.Ye., inzhener; BOGUSLAVSKIY, P.Ye., kandidat tekhnicheskikh nauk; VORONKOV, I.M., professor, GITINA, L.Ya., inzhener; GROMAN, M.B., inzhener; GOROKHOV, N.V., doktor tekhnicheskikh nauk [deceased]; DENISYUK, I.N., kandidat tekhnicheskikh nauk; DOVZHIK, S.A., kandidat tekhnicheskikh nauk; DUKEL'SKIY, M.P., professor, doktor khimicheskikh nauk [deceased]; DYKHOVICHNYY, A.I., professor; ZHITKOV, D.G., professor, doktor tekhnicheskikh nauk; KOZLOVSKIY, N.S., inzhener; LAKHTIN, Yu.M., doktor tekhnicheskikh nauk; LEVENSON, L.B., professor, doktor tekhnicheskikh nauk [deceased]; LEVIN, B.Z., inzhener; LIPKAN, V.F., inzhener; MARTYNOV, M.V., kandidat tekhnicheskikh nauk; MOLEVA, T.I., inzhener; NOVIKOV, F.S., kandidat tekhnicheskikh nauk; OSETSKIY, V.M., kandidat tekhnicheskikh nauk; OSTROUMOV, G.A.; PONOMARENKO, Yu.F., kandidat tekhnicheskikh nauk; RAKOVSKIY, V.S., kandidat tekhnicheskikh nauk; REGIRER, Z.L., inzhener; SOKOLOV, A.N., inzhener; SOSUNOV, G.I., kandidat tekhnicheskikh nauk; STEPANOV, V.N., professor; SHEMAKHANOV, M.M., kandidat tekhnicheskikh nauk; EL'KIND, I.A., inzhener; YANUSHEVICH, L.V., kandidat tekhnicheskikh nauk; BOKSHITSKIY, Ya.M., inzhener, redaktor; BULATOV, S.B., inzhener, redaktor; GASHINSKIY, A.G., inzhener, redaktor; GRIGOR'YEV, V.S., inzhener, redaktor; YEGURNOV, G.P., kandidat tekhnicheskikh nauk, redaktor; ZHARKOV, D.V., dotsent, redaktor; ZAKHAROV, Yu.G., kandidat tekhnicheskikh nauk, redaktor; KAMINSKIY, V.S., kandidat tekhnicheskikh nauk, redaktor; KOMARKOV, Ye.F., professor, redaktor; KOSTYLEV, B.N., inzhener, redaktor; POVAROV, L.S., kandidat tekhnicheskikh nauk, redaktor; ULINICH, F.R., redaktor; KLORIK'YAN, S.Kh., otvetstvennyy redaktor; GLADILIN, L.V., redaktor;

(Continued on next card)

BEYLINA, TS.O. --- (continued) Card 2.

RUPPENEYT, K.V., redaktor; TERPIGOREV, A.M., glavnyy redaktor; BARABANOV, F.A., redaktor; BARANOV, A.I., redaktor; BUCHNEV, V.K., redaktor; GRAFOV, L.Ye., redaktor; DOKUKIN, A.V., redaktor; ZADEMID-KO, A.N., redaktor; ZASYAD'KO, A.F., redaktor; KRASNIKOVSKIY, G.V. redaktor; LETOV, N.A., redaktor; DISHIN, G.L., redaktor; MAN'KOV-SKIY, G.I., redaktor; MEL'NIKOV, N.V., redaktor; CHIKA, D.G., redaktor; OSTROVSKIY, S.B., redaktor; POKROVSKIY, N.M., redaktor; POLSTYANOY, G.N., redaktor; SKOCHINSKIY, A.A., redaktor; SONIN, S.D., redaktor; SPIVAKOVSKIY, A.O., redaktor; STANCHENKO, I.K., redaktor; SUDOPLATOV, A.P., redaktor; TOPCHIYEV, A.V., redaktor; TROYANSKIY, S.V., redaktor; SHEVYAKOV, L.D., redaktor; BYKHOV-SKAYA, S.N., redaktor izdatel'stva; ZAZUL'SKAYA, V.F., tekhnicheskiy redaktor; PROZOROVSKAYA, V.L., tekhnicheskiy redaktor.

[Mining; an encuclopedic handbook] Gornoe delo; entsiklopedicheskii spravochnik. Glav.red. A.M. Terpigorev. Chleny glav.red. F.A. Barabanov i dr. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po ugol'noi promysh]. Vol.1. [General engineering] Obshchie inzhenernye svedeniia. Redkollegiia toma S.Kh.Klorik'ian i dr. 1957. 760 p. (Mining engineering) (MLRA 10:10)

ZHARKOV, D.V.

NIKITIN, Yevgeniy Mikhaylovich; KARLIN, David Mironovich; ZHARKOV, D.V., red.; MURASHOVA, N.Ya., tekhn.red.

[Theoretical mechanics for students in engineering schools] Teoreticheskaia mekhanika dlia tekhnikumov. Moskva, Gos.izd-vo tekhniko-teoret.lit-ry, 1957. 663 p. (MIRA 10:12)
(Mechanics)

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ZHARKOV, D. V.

VORONKOV, Ivan Mikhaylovich; ZHARKOV, D.V., red.; AKHLAMOV, S.N., tekhn.red.

[A course in theoretical mechanics] Kurs teoreticheskoi mekhaniki, Izd. 7-oe, dop. Moskva, Gos.izd-vo tekhniko-teoret. lit-ry, 1957. 596 p. (MIRA 11:2)

(Mechanics)

ARTOPOLEVSKIY, I.I.; ZHARKOV, D.V., redaktor; GAVRILOV, S.S., tekhnicheskiy redaktor

[The theory of mechanisms and machines] Teoriia mekhanizmov i mashin. Izd. 3. Moskva, Gos. izd-vo tekhn.-teoret. lit-ry, 1953. 712 p. (MLRA 7:10)

(Mechanics, Applied) (Machinery, Kinematics of)

VORONKOV, I.M.; ZHARKOV, D.V., redaktor; TUMARKIN, N.A., tekhnicheskiy redaktor.

[Course in theoretical mechanics] Kurs teoreticheskoi mekhaniki. Izd. 4., perer. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1953. 552 p.
(Mechanics) (MLRA 7:8)

VORONKOV, I.M.; ZHARKOV, D.V., redaktor; TUMARKINA, N.A., tekhnicheskiy redaktor.

[Course of theoretical mechanics] Kurs teoreticheskoi mekhaniki. Izd. 5. stereotipnoe. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1954. 552 p.
(Mechanics) (MLRA 7:7)

PAINLEVE, Paul; VESELOVSKIY, Y.N. [translator]; ZHARKOV, D.V., redaktor; AKHLAMOV, S.N., tekhnicheskiy redaktor.

[Lectures on friction. Translation from the French] Lektsii o trenii. Per. s frantsuzskogo I.N.Veselovskogo. Moskva, Gos.izd-vo tekhniko-teoret. lit-ry, 1954. 316 p.
(Friction) (MIRA 8:5)

VESELOVSKIY, Ivan Nikolayevich; ZHARKOV, D.V., redaktor; AKHLAMOV, S.N., tekhnicheskiy redaktor

[Collection of problems in theoretical mechanics] Sbornik zadach po teoreticheskoi mekhanike. Pri red.uchastii D.V.Zharkova. Moskva, Gos.izd-vo tekhniko-teoret.lit-ry, 1955. 500 p.
(Mechanics--Problems, exercises, etc.) (MIRA 9:1)

PRIKHOD'KO, Aleksandr Nikolayevich; SAFRONOV, Mikhail Nikolayevich; VORONKOV, I.M., redaktor; ZHARKOV, D.V., redaktor; GAVRILOV, S.S., tekhnicheskiy redaktor

[A course in theoretical mechanics for technical schools] Kurs teoreticheskoi mekhaniki dlia tekhnikumov. Pod red. I.M.Voronkova i D.V.Zharkova. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1956. 116 p.

(Mechanics) (MIRA 9:11)

NIKOLAI, Yevgeniy Leopol'dovich; ZHARKOV, D.V., redaktor; GAVRILOV, S.S., tekhnicheskiy redaktor

[Teoretical mechanics] Teoreticheskaia mekhanika. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry. Pt.1. [Statics, kinematics] Statika, kinematika. Izd. 17-oe. 1956. 280 p. (MLRA 9:7)
(Kinematics) (Statics)

ZHARKOV, Fedor Andreyevich, kand. ekon. nauk; KOSTIN, V.P., red.

[Organization of work and material incentives for workers on state grain farms] Organizatsiia truda i material'noe pooshchrenie rabochikh zernovykh sovkhozov. Moskva, Izd-vo "Ekonomika," 1964. 68 p. (MIRA 17:6)

1. Starshiy prepodavatel' Sverdlovskogo sel'skokhozyaystvennogo instituta (for Zharkov).

POLIVANOV, K.M.; ZHARKOV, F.P.; SOKOLOV, V.A.

Parametron with a ferromagnetic core. Izv.vys.ucheb.zav.; radiotekh. 5 no.5:543-551 S-O '62. (MIRA 15:11)

1. Rekomendovana kafedroy teoreticheskikh osnov elektrotekhniki Moskovskogo energeticheskogo instituta.
(Electronic calculating machines)

42667

S/142/62/005/005/001/009
E192/E382

9.2572

AUTHORS: Polivanov, K.M., Zharkov, F.P. and Sokolov, V.A.

TITLE: Parametron with ferromagnetic cores
Part II. Representation of the parametron states on the Van-der-Pol plane; transients

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, v. 5, no. 5, 543 - 551

TEXT: Part I of the article, with equations up to (67) (inclusive), was published in no. 4 issue, 1962, of this journal; the notation adopted in Part II is the same as in the previous article. For the purpose of representation of the parametron equations in the Van-der-Pol plane, a current vector is defined as:

$$Ie^{j\vartheta} = U + jV \tag{68}$$

where $U = I\cos\vartheta$ and $V = I\sin\vartheta$.

The differential equations of the system thus become

$$\frac{dU}{d\tau} = \frac{1}{2}\left\{\left(a_1 I_p - \frac{1}{Q}\right)U - SV + \frac{a_2}{2} I^2 V\right\} \tag{70}$$

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$$\frac{dV}{d\tau} = -\frac{1}{2}\left\{\left(a_1 I_p + \frac{1}{Q}\right)V - SU + \frac{a_2}{2} I^2 U\right\} \qquad (71).$$

These two equations can be solved comparatively easily if the differential inductance is assumed to be linear, i.e.

$$\lambda(i_{ab}) = -a_1 i_{a_1 b} \qquad (72).$$

In this case, the transient time is given by:

$$\bar{\tau} = \frac{\ln \frac{2}{a_2}\left\{\sqrt{(a_1 I_p)^2 - \frac{1}{Q^2}} - I_p^2 a_2\right\} - 2 \ln U_o}{a_1 I_p - 1/Q} \qquad (76).$$

However, comparison of Eq. (76) with experiment showed that the measured transient time exceeded the calculated one by about three to four periods T . Eqs. (70) and (71) cannot be integrated directly but numerical integration by using the Adams-Krylov method is possible. Such integration was carried out for the

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following parameters:

$$a_1 = 3, \quad a_2 = 15, \quad \nu = 1, \quad Q_o = 5, \quad I_p = 0.1a \tag{79}$$

and it was found that the transient time was $\bar{\tau} = 14\ T$; on the other hand, the experimental value was $(11 - 13)T$. A complete description of the system can be given by constructing a set of curves representing the movement of the point which describes the state of the system. This is done by mapping "the field" of the system in U, V plane. The principal equation for the mapping is obtained by dividing Eq. (70) by (71). An example of such curves in U,V plane for $\nu = 1$ is shown in Fig. 10. Two singular points Y_1 and Y_2 can be seen in this figure; these correspond to the steady-state equilibrium. The system is also investigated for the case when $Q \to \infty$ by mapping Eqs. (70) and (71) in U, V plane; the locus of the stable equilibrium points for various ν is determined and the conditions of strong excitation (unlike those represented by the curves of Fig. 10) are investigated. There are 17 figures.

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X

Parametron with S/142/62/005/005/001/009
E192/E382

ASSOCIATION: Kafedra teoreticheskikh osnov elektrotekhniki Moskovskogo energeticheskogo instituta (Department of Theoretical Principles of Electrical Engineering of the Moscow Power-engineering Institute)

SUBMITTED: January 29, 1962

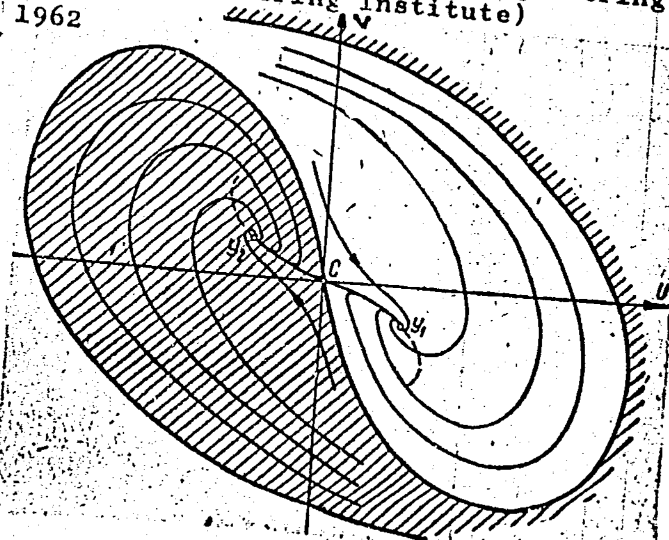

Fig. 10

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POLIVANOV, K.M.; ZHARKOV, F.P.; SOKOLOV, V.A.

Parametrons with ferromagnetic cores. Izv. vys. ucheb. zav.; radiotekh. 5 no.4:417-430 Jl-Ag '62. (MIRA 16:6)

1. Rekomendovana kafedroy teoreticheskikh osnov elektrotekhniki Moskovskogo energeticheskogo instituta.
(Electronic calculating machines)
(Pulse techniques(Electronics))

ZHARKOV, Feliks Petrovich, aspirant; SOKOLOV, Vadim Azrailovich, assistent; TKACHEV, Lev L'vovich, inzh.

Analysis of the equation of an inductive parametron using an analog computer. Izv.vys.ucheb.zav.;elektromekh. 7 no.1:3-12 '64. (MIRA 17:9)

1. Moskovskiy energeticheskiy institut (for Zharkov, Sokolov).

41423

S/142/62/005/004/001/010
E192/E382

9.2572

AUTHORS: Polivanov, K.M., Zharkov, F.P. and Sokolov, V.A.

TITLE: Parametron with ferromagnetic cores. Part 1. Equation of the parametron and its analysis for steady-state conditions

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, v. 5, no. 4, 1962, 417 - 430

TEXT: The parametron considered is of the type first investigated by N.D. Papaleksi in 1931 and is shown in Fig. 1. The parametric windings are connected in series and connected to the supply source. The resonant windings are also connected in series but in opposition to the parametric windings. The resonant windings are "shorted" by a capacitor. The losses in the resonant circuit can be taken into account by introducing an equivalent resistance connected in series or in parallel with the capacitor. Analysis of the system is based on the works of A.A. Andronov and M.A. Leontovich (ZhTF, 1927, 59, no. 5-6) and others and on the recent work of R.M. Kantor (Izv. vuzov SSSR - Radiotekhnika, 1961, 4, no. 3, 285).

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The final equation describing the operation of the system is:

$$\frac{di}{d\tau} = -\left[\lambda(i_p - i) + \lambda(i_p + i)\right]\frac{di}{d\tau} +$$

$$+\left[\lambda(i_p - i) - \lambda(i_p + i)\right]\frac{di_p}{d\tau} - \frac{1}{Q}i - \frac{1}{\nu^2}\int i\,d\tau \qquad (10)$$

where

$$\lambda = \frac{\ell}{L}; \quad \tau = \omega t; \quad Q_o = \frac{\omega_o L}{r}; \quad \omega_o^2 = \frac{1}{LC}; \quad \nu = \frac{\omega}{\omega_o};$$

$$Q = \frac{\omega L}{r} = \nu Q_o \qquad (9),$$

in which the following notation is adopted: i is the current in the resonant circuit; $i_o + i_p = i_o + I_p \sin 2\omega t$ is the parametric excitation current; i_o is the DC component determining the operating point on the magnetic characteristic;

i_p is the alternating component (pump signal); $L = 2L(i_o)$ where the inductances are defined by

$$\omega \frac{d\Phi_1}{di} = L(i_o + i_p - i) = L(i_o) + l_1; \quad \omega \frac{d\Phi_2}{di} = L(i_o + i_p + i) = L(i_o) + l_2,$$

where $l_1 = l(i_p - i)$, $l_2 = l(i_p + i)$, (4)

in which $\Phi_{1,2}$ is the magnetic flux of the first and second core, respectively. Eq. (10) can be solved by using the method of slowly-changing amplitudes. For this purpose, it is assumed that:

$$\lambda(i_{ab}) = -a_1 i_{ab} + a_2 i_{ab}^2 \qquad (11)$$

where

$$i_{a,b} = i_p \pm i .$$

The current in the resonant circuit can be assumed as being sinusoidal:

$$i = I \cos \Theta \qquad (12)$$

where:

$$\Theta = \omega t + \vartheta = \tau + \vartheta .$$

By using expressions (11) and (12), Eq. 10 is transformed into two equations, one of which determines the amplitude and the other the phase of the current in the system. These equations are:

$$\frac{dI}{d\tau} = \frac{1}{2} I \left[a_1 I_p \cos 2\vartheta - \frac{1}{Q} \right] \quad (22)$$

$$\frac{d\vartheta}{d\tau} = -\frac{1}{2} \left[a_1 I_p \sin 2\vartheta + 1 - \frac{1}{\nu^2} + a_2 \left(I_p^2 + \frac{1}{2} I^2 \right) \right] \quad (23) .$$

The solutions of Eqs. (22) and (23) can easily be found for the steady state and it is shown that the current is given by:

$$I^2 = \frac{2}{a_2} \{ \mp R(\nu) + S(\nu) \} S \quad (27б)$$

where

$$R(\nu) = \sqrt{(a_1 I_p)^2 - \frac{1}{Q^2}} ; \quad S = \frac{1}{\nu^2} - 1 - a_2 I_p^2 \quad (28) .$$

Card 4/5

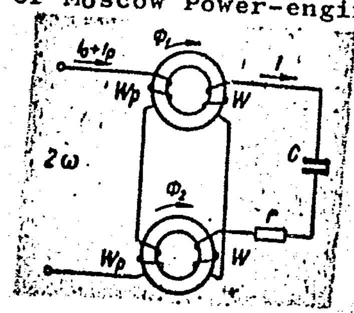
Parametron with S/142/62/005/004/001/010
E192/E382

Eq. (27б) is used to investigate the amplitude of the current as a function of the normalised frequency ν for $a_2 > 0$. The stability and the conditions of existence of the solutions for $a_2 > 0$ are also investigated. The effect of losses and the amplitude of the oscillations as a function of frequency for $a_2 < 0$ are also studied. There are 8 figures.

ASSOCIATION: Kafedra teoreticheskikh osnov elektrotekhniki Moskovskogo energeticheskogo instituta (Department of Theoretical Principles of Electrical Engineering of Moscow Power-engineering Institute)

SUBMITTED: January 29, 1962

Fig. 1:



Card 5/5

BOGOLYUBOV, V.Ye., doktor tekhn.nauk; ZHARKOV, F.P., inzh.; GUSEV, G.G., inzh.

Calculation of minimal losses in a circuit containing a ferromagnetic remagnetized by a charged condenser. Elektrichestvo no.9:60-61 S '65. (MIRA 18:10)

1. Moskovskiy energeticheskiy institut.

L 11200-66 EWT(d) IJP(c)

ACC NR: AP6001931 SOURCE CODE: UR/0142/65/008/006/0637/0646

AUTHOR: Polivanov, K. M.; Zharkov, F. P.

ORG: none

TITLE: Vector analysis of phase plane

SOURCE: IVUZ. Radiotekhnika, v. 8, no. 6, 637-646

TOPIC TAGS: vector analysis, automatic control system

ABSTRACT: The article proves that stability criteria of singular points can be found by vector-analysis operations applied to the velocity field of a state point. Any process describable by a second-order equation can be represented as a plot of velocity vs. position on a phase (state) plane (an example of pendulum motion is given). It is shown that general characteristics of a velocity field carry essential information on solution of the system describable by a second-order equation. The nature of singular points (stable or unstable node or focus, center, saddle) is discerned by applying certain rules to div $\underline{v}$ and rot$_z$ $\underline{v}$. The phase-plane representation can also be used for describing processes in other nonvelocity-type

Card 1/2 UDC: 621.372.061

L 11100-66

ACC NR: AP6001931

systems, such as a nonlinear electric circuit; Kirchhoff's laws are used as a basis in an example. The vector-analysis of a velocity field describable by third- and higher-order equations is also possible; the singular-point motion takes place in a phase space whose number of dimensions is equal to the order of the equation. Orig. art. has: 5 figures, 50 formulas, and 1 table.

SUB CODE: 12, 09 / SUBM DATE: 03Jul65

Card 2/2

ZHARKOV, F S

Karmannyy spravochnik inzhenera lespromkhoza (Pocket Handbook of the lumber industry engineer) Moskva, Goslesbumizdat, 1950.
162 p. tables.
At lead of title: Russia. Ministerstvo Lesnoy i Bumazhnoy Promshlennosti.
"Rekonenduyemaya Literatura": p.154-155.

BOGOLYUBOV, Valentin Yevgen'yevich, doktor tekhn. nauk, prof.; ZHARKOV, Feliks Petrovich, aspirant

Calculation of a condenser charge process through a coupling loop containing a toroid with a rectangular hysteresis loop. Izv. vys. ucheb. zav.; elektromekh. 6 no.10:1241-1244 '63. (MIRA 17:1)

1. Moskovskiy energeticheskiy institut (for Bogolyubov).
2. Kafedra teoreticheskikh osnov elektrotekhniki Moskovskogo energeticheskogo instituta (for Zharkov).

DUBROV, M.M.; ZHARKOV, F.Ya.; AKIMOV, P.P., red.; VOLCHOK, K.M., tekhn. red.

[Auxiliary mechanisms of river ships; an atlas] Vspomogatel'nye mekhanizmy rechnykh sudov; atlas. Leningrad, Izd-vo M-va morskogo i rechnogo flota SSSR, 1953. 203 p. (MIRA 14:6)
(Marine engineering) (Ships—Equipment and supplies)

DUBROV, M.M.; ZHARKOV, F.Ya.; AKIMOV, P.P., red.; VOLCHOK, K.M., tekhn.red.

[Auxiliary mechanisms on river craft; an atlas] Vspomogatel'nye mekhanizmy rechnykh sudov; atlas. Leningrad, Izd-vo M-va morskogo i rechnogo flota SSSR, 1953. 203 p. (MIRA 13:8)
(Ships--Equipment and supplies)
(Inland water transportation)

ZHARKOV, F. Ya.

5 Vspomogatel'nyye mekhanizmy rechnykh sudov (Auxiliary machinery of river craft) Atlas, by M. M. Dubrov i F. Ya. Zharkov. Leningrad, Izd-vo Ministerstva Morskogo i Rechnogo Flota SSSR, 1953.

v.-p. (1 v.) Diagrs.

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R001964530002-1"

PA 163T70

USSR/Nuclear Physics - Neutrino
Beta Decay, Spectrum

Jun 50

"Neutrinos and Anti-Neutrinos," G. F. Zharkov, Phys Inst imeni Lebedev, Acad Sci USSR

"Zhur Eksper i Teoret Fiz" Vol XX, No 6, pp 492-496

Theory of beta-decay in which neutrino and anti-neutrino cannot be distinguished in the beta-spectrum is shown to be possible. Submitted 17 Nov 49.

163T70

ZHARKOV, G.

USSR/Electronics - Measurements
Components

Aug 52

"Determination of Coil Parameters by Means of a Cathode-Ray Oscillograph," G. Zharkov

"Radio" No 8, p 59

Suggests a method by which a cathode-ray oscilloscope may be used to det the resistance, inductance, impedance, and Q of coils. Editors note that the values of R and Q are good only for the frequencies used, and state that the method cannot be used for rf coils.

226T35

USSR/Nuclear Physics - Mesons, Pi Jun 52

"Formation of π-Meson Pairs by Photons on Nucleons," G. F. Zharkov, Phys Inst imeni Lebedev, Acad Sci USSR

"Zhur Eksper i Teoret Fiz" Vol XXII, No 6, pp 677-686

Discusses the effect of the formation of pairs of π-mesons by photons on free nucleons. Two variants of interaction of pseudoscalar mesons with nucleons --a pseudoscalar and a pseudovector--are investigated.

217T87

Shows that in both cases cross sections substantially differ in magnitude and angular dependence. Indebted to Prof M. A. Markov and I. A. Lebedeva. Received 12 Dec 51.

217T87

ZHARKOV, G. F.

ZHARKOV, G. F.

USSR.

ON THE MAGNETIC MOMENT OF THE NEUTRINO. G. F. Zharkov. ZLur. Eksptl'. i Teoret. Fiz. 24, No. 5, 629-34 (1953). (In Russian) 2

The magnetic moment arising from the self energy which comes from the coupling used in β decay between the neutrino, electron, and nucleon fields) is calculated to lowest order. The expressions are infinite unless the integrands are cut off. This is done at a point which is determined by making the self-mass of the neutrino less than the highest limit set on it by experiment. It is then found that μ_ν/μ_e, the ratio of the neutrino to electron magnetic moment, is ~ 10^{-14} (Science Abstracts)

ZHARKOV, G.F.

USSR/Physics - Pi-mesons FD-1483

Card 1/1 : Pub. 146-6/20

Author : Zharkov, G. F.

Title : Scattering of pi-mesons on nucleons in the theory of damping

Periodical : Zhur. eksp. i teor. fiz., 27, 296-306, Sep 1954

Abstract : Scattering of pseudoscalar pi-mesons on nucleons according to the covariant damping theory taking into consideration an arbitrary mixture of pseudoscalar and pseudovectorial bonds is analyzed. It is shown that the theory of damping as well as the theory of perturbations cannot concur with experiments except maybe in the narrow range of 30-40 Mev in which experimental data are not sufficiently available. Indebted to M. A. Markov. Eighteen references including 15 foreign.

Institution : Physics Institute imeni Lebedev, Acad Sci USSR

Submitted : December 1, 1953

ZHARKOV, G.F.

On the theory of damping. Nauk. zap. L'viv. un. 33:71-77 '55.
(Nucleons) (Mesons) (MLRA 10:6)

ZHARKOV, G.F.

Renormalization of vacuum infinities. Nauk. zap. L'viv. un. 33:78-83 '55. (MIRA 10:6)

(Vacuum) (Particles, Elementary)

ZHARKOV, G.F.

All-Union conference on quantum electrodynamics and the theory of elementary particles. Usp.fiz.nauk 56 no.4:637-647 Ag '55. (MLRA 9:1)

(Moscow--Quantum theory--Congresses) (Particles, Elementary)

ZHARKOV, G.F.

USSR/Theoretical Physics - Quantum Theory of Fields. B-6

Abs Jour : Ref Zhur - Fizika, No 4, 1957, 8473

Author : Zharkov, G.F.
Inst :
Title : Concerning the Renormalization of Vacuum Infinities.

Orig Pub : Nauk. zap. L'vivs'k. un-tu, 1955, 33, 78-83

Abstract : It is known that by subtracting from the interaction Hamiltonian a certain renormalized constant, interpreted as the vacuum energy, it is possible to eliminate the singularities from the S matrix, due to the so-called vacuum loops. An explicit of this renormalization constant is obtained in this work.

Card 1/1

ZHARKOV, G.F.

USSR/Theoretical Physics - Quantum Theory of Fields. B-6

Abs Jour : Ref Zhur - Fizika, No 4, 1957, 8472

Author : Zharkov, G.F.
Inst :
Title : Concerning Damping Theory.

Orig Pub : Nauk. zap. L'vivs'k, un-tu, 1955, 33, 71-77

Abstract : The author investigates the problem of what diagrams, in the sense of perturbation theory, are taken into account by the damping theory for the case of meson-nucleon scattering.

Card 1/1

ZHARKOV, G.F. translator.

Foundations of statistical mechanics. D. Ter Haar. (to be continued). A yranslation from an article from "Reviews of Modern Physics," 27, 289, 1955 by G.F. Zharkov. Usp.fiz.nauk. 59 no.4:619-671 Ag '56. (MLRA 9:11)

(Statistical mechanics)

AUTHOR: Zharkov, G. F. 56-2-20/51

TITLE: On the Theory of Ferromagnetic Superconductors (K teorii ferromagnitnykh sverkhprovodnikov)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958 Vol 34, Nr 2, pp 412-416 (USSR)

ABSTRACT: This work determines the conditions for the existence of the superconducting state in case of massive homogeneous samples having the shape of ellipsoids of revolution. The spontaneous magnetisation of these samples is assumed to form an arbitrary angle with the direction of the external field. First a formula for the processes, which take place at constant temperature in a homogeneous and constant magnetic field, is written down. This function has an extremum in the equilibrium. The here examined test piece is assumed to consist of one single domain. Here the author investigates quite massive samples so that the surface effects can be neglected. A formula for the ferromagnetic substance being in the superconducting state, is written down. An equilibrium of the normal and of the superconducting phase is possible only in the case of equality of the thermodynamic

Card 1/3

On the Theory of Ferromagnetic Superconductors

56-2-20/51

potentials. First here the magnetic field inside and outside the oblong ellipsoid of revolution is ascertained. Then the critical field strength H_c of the external magnetic field is determined, at which the normal and the superconducting phase can be in equilibrium. A condition for the possibility of the existence of superconductivity is given. Then the existence conditions are discussed. In oblong massive samples no observation of superconductivity may be expected. In case of very much flattened samples a superconductivity in an arbitrarity low external field is possible. For the strength of this field a superior limit exists. Summarizing, the following can be said: The possibility of observation of the superconducting state in massive ferromagnetic samples is formally facilitated in case of the utilization of samples with a high demagnetizing factor. But it is practically impossible to obtain a test piece consisting of only one domain, the transverse dimensions of which (i. e. the test piece) are 10^4 times as big as the thickness of the test piece. Therefore a further analysis of this problems, with regard to the role of the domain structure, the energy of the magnetic anisotropy, etc. is necessary. There are 4 references, all of which are Soviet.

Card 2/3

On the Theory of Ferromagnetic Superconductors

56-2-20/51

ASSOCIATION: Institute of Physics imeni P. N. Lebedev of the AS USSR (Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR)

SUBMITTED: July 19, 1957

AVAILABLE: Library of Congress

1. Ferromagnetic superconductors-Theory 2. Magnetic fields-Measurement

Card 3/3

AUTHOR: Zharkov, G. F. SOV/56-34-5-23/61

TITLE: A Semi-Phenomenological Theory of Nucleon-Nucleon Interaction (Polufenomenologicheskaya teoriya vzaimodeystviya nuklonov s nuklonami)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 5, pp. 1211-1220 (USSR)

ABSTRACT: This paper discusses the results of the application of the semiphenomenological isobar theory to the problem of the deuteron and to the problem of the scattering of nucleons by nucleons. In the second part of this paper the wave equation of a two-nucleon system is derived. The author first gives the following expression for the Lagrangian of interaction $L = L_1 + L_2$,

$$L_1 = \frac{g}{\mu}\bar{\psi}\gamma_5\gamma_\mu\tau\frac{\partial\varphi}{\partial x_\mu}\psi + igs\bar{\psi}\gamma_5\tau\varphi\psi; \quad L_2 = \frac{g_1}{\mu}(\bar{\psi}\vec{S}\frac{\partial\varphi}{\partial x_\mu}B_\mu + \bar{B}_\mu\vec{S}^+\frac{\partial\varphi}{\partial x_\mu}\psi)$$

Card 1/3

SOV/56-34-5-23/61

A Semi-Phenomenological Theory of Nucleon-Nucleon Interaction

Besides the two-nucleon state only such states are considered, in which there is not more than one meson. The author then calculated the following approximation: The nucleon mass and the isobaric mass are assumed to be very great quantities ($M \gg \mu$). Some other simplifying assumptions are made. Expressions are given for the spin matrices and for the potential energy of the interaction of two nucleons. These expressions are specialized with respect to the cases $I = 0$ and $I = 1$. (I denotes the spin of the system consisting of two nucleons). The last part of this paper gives numerical results. A table contains the values of the potentials which were computed for the following system of constants: $\Delta = 2,1\ \mu$; $g^2 = 0,085$; $g_1^2 = 0,063$; $s = 1,8$. The nucleon mass is assumed to be equal to $M = 6,75\ \mu$. The theoretical values are, generally speaking, somewhat higher than the experimental ones. Nevertheless, the theory satisfactorily agrees with the experiments within the range of low energies. The calculations of this paper are essentially non-relativistic and may be used only for rather low energies. There are 3 tables and 7 references, 3 of which are Soviet.

Card 2/3

A Semi-Phenomenological Theory of Nucleon-Nucleon Interaction SOV/56-34-5-23/61

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev, AS USSR)

SUBMITTED: December 6, 1957

1. Nuclei--Theory 2. Deuterons--Scattering 3. Nuclei--Scattering 4. Nuclear spins--Analysis 5. Mathematics--Applications

Card 3/3

21(1,8); 24(5) PHASE I BOOK EXPLOITATION . SOV/3369

Vsesoyuznaya mezhvuzovskaya konferentsiya po kvantovoy teorii poley i teorii elementarnykh chastits. Uzhgorod, 1958

Problemy sovremennoy teorii elementarnykh chastits. No. 2: Trudy konferentsii... (Problems in the Modern Theory of Elementary Particles. Nr. 2: Transactions of the All-Union Inter-Vuz Conference on the Quantum Field Theory and the Theory of Elementary Particles) Uzhgorod, Zakarpatskoye oblastnoye izd-vo, 1959. 214 p. 5,000 copies printed.

Ed.: Yu. Lomsadze, Docent; Tech. Ed.: M. Belous.

PURPOSE: This book is intended for physicists, particularly those concerned with problems in the field of elementary particles and the quantum theory.

COVERAGE: This book contains articles on elementary particles originally read at the All-Union Inter-Vuz Conference held at Uzhgorod State University on October 26, 1958. Among the topics discussed are: the spinor field theory, the fusion theory, Lorentz contractions, parity studies, nucleon-nucleon scattering, etc. English abstracts accompany each article. References follow each article.

ZHARKOV, G.F.

Dolginov, A.Z. Polarization of Quanta Emitted by μ Mezoatoms 138

Barashenkov, V.S. Optical Analysis of the Interaction Between Fast Nucleons and Pions Particles With Nucleons and Nucleus 142

Zharkov, G.F. The Semi-Phenomenological Theory of Nuclear Forces 149

Fisher, Ya., and G. Chulli. Partial Wave Analysis of the Generation of Particles 157

Zlatev, I.S., and P.S. Isayev. The Effect of the Form-Factor on the Processes of Bremsstrahlung and Generation of Pairs on Protons 155

Filimonov, V.A. On the Interaction Between Δ -Particles and Nucleons in the Hypernuclei 175

Lomsadze, Yu.M. The 1-Summation of the Perturbation Method Series 182

Lomsadze, Yu.M., V.I. Lend'yel, and I.Yu. Krivskiy. The Problem of Nucleon-Nucleon Scattering in High-Energy Regions 195

Lomsadze, Yu.M., V.I. Lend'yel, I.Yu. Krivskiy, V.I. Fushchich, I.V. Khimich, L.P. Lukin, and B.M. Ernst. The Application of the Modified Perturbation Method to the Interpretation of the Nucleon-Nucleon Scatterings 211

24.7100,24.7700,24.2100

76997
SOV/56-37-6-37/55

AUTHOR: Zharkov, G. F.

TITLE: Intermediate State in Ferromagnetic Superconductors

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1784-1788 (USSR)

ABSTRACT: Equations were derived which predict, in the intensity of an external magnetic field, an interval for which the single-domain ferromagnetic ellipsoid may exist in the intermediate state. The structure of this state was studied within the framework of the unbranched model for a superconducting ferromagnetic plate. According to the theory of superconductivity (cf. G. F. Zharkov, Zhur. Eksp. i Teoret. Fiz., 34, 412, 1958), the thermodynamic potential of a sample with magnetic permeability, per unit volume, is:

$$\Phi_n = \Delta - 2\pi M_0^2 (1 - n_1) - M_0 H_0,$$

$$\Phi_s = H_0^2 / 8\pi (1 - n_1),$$

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Intermediate State in Ferromagnetic Superconductors

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(where index n(s) corresponds to the sample which is entirely in normal (superconducting) state; $\Delta = \Phi_n^o - \Phi_s^o > 0$ and Φ_n^o is thermodynamic potentials per unit volume in the absence of external magnetic field; $4\pi n_1$ is coefficient of demagnetization along the rotation axis of the sample; term n_1 varied from 0 to 1 for cylindrical and flat disc samples, respectively). The field $H_o > 0$, if it is parallel to M_o, and $H_o < 0$ if it is perpendicular to M_o. The condition $\Phi_s = \Phi_n$ defined certain critical fields:

$$H^{(\pm)} = -4\pi M_0 (1-n) \pm \sqrt{8\pi\Delta (1-n)}.$$

In the fields with $H^{(-)} < H_o < H^{(+)}$, $\Phi_s < \Phi_n$, i.e., thermodynamically, the favorable state of the sample

Card 2/3

Intermediate State in Ferromagnetic Superconductors

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is the state of superconduction, whereas in the fields $H_0 > H^{(+)}$ and $H_0 < H^{(-)}$, $\Phi_n < \Phi_s$, i.e., the favorable state is the normal state. In the fields with $0 \leqslant h \leqslant h'$ the relation between the thickness a and h was given by the equation:

$$a = (\pi l \Delta_1 / h^2 [\ln (0,56/h) - 0,5 \alpha h])^{1/2}.$$

The structure of the intermediate state in a branch model will be analyzed by the author in his forthcoming paper. There is 1 graph; and 8 references, 6 Soviet, 1 U.K., 1 U.S. The U.S. and U.K. references are: B. Mattias, et al., Phys. Rev. Lett., 1, 448 (1958); E. R. Andrew, Proc. Roy. Soc., 194A, 98 (1948).

ASSOCIATION: P. N. Lebedev Physics Institute Academy of Sciences USSR, USSR (Fizicheskiy institut imeni P. N. Lebedev Akademii nauk SSSR, SSSR)

SUBMITTED: July 22, 1959

Card 3/3

SAKOVA, A.A., starshiy bibliograf; ZHARKOV, G.F., kand. fiziko-matematicheskikh nauk

Bibliographic index of works of collaborators of the Theoretical Division of the P. N. Lebedev Physical Institute of the Academy of Sciences of the U.S.S.R. for 1934-1960. Trudy fiz. inst. 16: 140-166 '61. (MIRA 15:2)

1. Biblioteka Fizicheskogo instituta imeni Lebedeva AN SSSR (for Sakova).

(Physics--Bibliography)

BELEN'KIY, S.Z.[deceased]; VUL, B.M.; ZHARKOV, G.F.; ZHDANOV, G.B.; SILIN, V.P.; FAYNBERG, V.Ya.; FEYNBERG, Ye.L.; LARIN, S.I., red.; UL'YANOVA, O.G., tekhn. red.

[From classical to quantum physics; fundamental representations in the theory of the constitution of matter]Ot klassicheskoi fiziki k kvantovoi; osnovnye predstavleniia ucheniia o stroenii materii. Moskva, Izd-vo Akad. nauk SSSR, 1962. 69 p. (MIRA 16:3)

(Physics) (Quantum theory) (Matter--Constitution)

S/030/62/000/011/003/005
D218/D308

AUTHOR: Zharkov, G.F., Candidate of Physical and Mathematical Sciences

TITLE: International conference on relativistic theories of gravitation

PERIODICAL: Akademiya nauk SSSR. Vestnik, no. 11, 1962, 118 - 119

TEXT: This conference was sponsored by the International Commission for the General Theory of Relativity and Gravitation and took place on July 25 - 31 at Jabłonna near Warsaw. The conference was attended by P.A.M. Dirac and S. Mandelstam (England), K. Møller (Denmark) V.A. Fok and V.L. Ginzburg (USSR), F. Feynman and P.G. Bergmann (USA), and others. Among the Soviet papers read at the conference were those by A.Z. Petrov (on the algebraic structure of the curvature and energy-momentum tensors) and A.L. Zel'manov (chronometric invariance and its consequences). The next conference is planned

Card 1/2

S/030/62/000/011/003/005
D218/D308

International conference ...

for 1965 in England.

Card 2/2

24.2140

37888

S/056/62/042/005/039/050
B108/B138

AUTHOR: Zharkov, G. F.

TITLE: The magnetic moment of thin superconducting films

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no.5, 1962, 1397-1399

TEXT: An expression is derived for the magnetic moment of a thin oblate ellipsoid of rotation in a magnetic field parallel to the axis of rotation, i. e., perpendicular to the surface. The basis of the calculations is the London equation for the field inside the superconducting film, curl curl $\vec{A} = -\delta^{-2}\vec{A}$, and curl curl $\vec{A} = 0$ for outside. The magnetic moment is given by $\vec{M} = \frac{1}{2c}\int[\vec{j}\vec{r}]d^3\vec{r}$, where $\vec{j} = (c/4\pi\delta^2)\vec{A}$. δ is the depth of penetration of the field. The solution of the London equation is expanded into a series in respect of the small parameter $\sim ab/\delta^2$. It is shown that with $b/\delta \ll 1$, $M_{\parallel}/M_{\perp} \approx b^3/\delta^2 af(x)$, where $x = \pi ab/4\delta^2$.

Card 1/2

The magnetic moment of thin ... S/056/62/042/005/039/050
B108/B138

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Institute of Physics imeni P. N. Lebedev of the Academy of Sciences USSR)

SUBMITTED: January 3, 1962

Card 2/2

24,2140

S/126/63/015/001/001/029
E032/E114

AUTHORS: Zharkov, G.F., and Hsü Lung-tao

TITLE: A superconducting ellipsoid in a magnetic field

PERIODICAL: Fizika metallov i metallovedeniye, v.15, no.1, 1963, 12-17

TEXT: It is noted that the behaviour of superconductors of finite dimensions in a magnetic field has not so far been discussed (except for the sphere). The case of a small superconducting ellipsoid of revolution with the axis of revolution parallel to the external magnetic field is discussed in the present paper. The field inside and outside the specimen is described in terms of the vector potentials $\underline{A}^{\pm}$ which are solutions of the equations

$$\mathrm{curl}\ \mathrm{curl}\ \underline{A}^{-} = -\delta^{-2}\underline{A}^{-} \quad (1)$$

and

$$\mathrm{curl}\ \mathrm{curl}\ \underline{A}^{+} = 0 \quad (2)$$

where δ is the depth of penetration of the field, and the signs + and - refer to points outside and inside the specimen respectively. It is assumed that c^2/δ^2 is small, where

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A superconducting ellipsoid in ... S/126/63/015/001/001/029
E032/E114

c is one half of the distance between the foci of the ellipsoid. The above two equations are then expressed in terms of prolate spheroidal coordinates and the solutions of the resulting second order partial differential equations are obtained in the form of series. Formulas are also obtained for the magnetic moment of the ellipsoid. The final section of the paper is concerned with the destruction of superconductivity of specimens by a magnetic field, using the Ginzburg-Landau phenomenological theory of superconductivity (V.L. Ginzburg, UFN, v.42, 1950, 169. V.L. Ginzburg and L.D. Landau, ZhETF, v.20, 1950, 1064). Formulas are derived for the critical field in the case of an oblate and a prolate ellipsoid.

ASSOCIATION: Fizicheskiy institut AN SSSR im. P.N. Lebedeva
(Physics Institute AS USSR imeni P.N. Lebedev)

SUBMITTED: March 12, 1962 (initially);
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S/126/63/015/001/027/029
E039/E435

AUTHORS: Hsü Lung-tao, Zharkov, G.F.

TITLE: The magnetic moments of small superconductors

PERIODICAL: Fizika metallov i metallovedeniye, v.15, no.1, 1963, 154-156

TEXT: The results of calculations on the magnetic moments for superconductors of small dimensions are given for the case of non-localized interactions. The magnetic moment M is calculated from the usual formula and integrated over the volume of the sample. For the particular case of a flattened disc with a magnetic field H_o parallel to its axis and taking into account only the first non-vanishing terms then the magnetic moment

$$M = -\frac{1}{8}BH_o\pi^2a^4b^2$$

where a is the radius and b the length of the cylinder. In the case of a thin circular wire radius R_o and length L ($L \gg R_o$) with the magnetic field parallel to the axis the magnetic moment is given by

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E039/E435

$$M = - H_o \frac{8\pi^2}{5 \cdot 5 \cdot 9} LR_o^5$$

Results are compared for small superconductors of different forms for the cases of London and Pippard interactions. Expressions are given for the susceptibility $x(M = xH_o)$ in the case of a sphere, a long cylinder, a thin film and a flattened disc. These expressions give only the first non-vanishing terms of the corresponding expansions. In the Pippard case the expressions contain unnecessary terms which are small compared with the size of the sample (radius in the case of a sphere and wire and thickness for film and disc). For very thin films even when prepared from Pippard superconductors (with a large coherence length) a number of Pippard factors are not realized and such films belong to a case intermediate between the Pippard and London models. There is 1 figure.

ASSOCIATION: Fizicheskiy institut AN SSSR im. P.N.Lebedeva (Physics Institute AS USSR imeni P.N.Lebedev)

SUBMITTED: May 15, 1962

Card 2/2

ACCESSION NR: AP4009374 S/0126/63/016/006/0820/0826

AUTHORS: Hsu, Lung-tao; Zharkov, G. F.

TITLE: Hollow superconductive cylinder with flow in a magnetic field

SOURCE: Fizika metallov i metallovedeniye, v. 16, no. 6, 1963, 820-826

TOPIC TAGS: superconductor, superconductive cylinder, magnetic field, congealed magnetic flow, critical field, London superconductor, quasi-wave function, Cooper pair, Planck constant

ABSTRACT: The authors obtain expressions for the critical fields of a hollow superconductive cylinder in an external magnetic field H_0 parallel to the axis of the cylinder, in the presence of a quantized "congealed" field H_n in the internal cavity and the simultaneous presence of a current I going through the cylinder. The authors work within the framework of macroscopic theory of superconductivity which is suitable for London superconductors near the critical temperature T_k. This theory involves a quasi-wave function ψ which plays the role of relative concentration of superconductive electrons. In the given case the basic equations are

$$\left(\nabla + i\frac{e^*}{\hbar c}A\right)^2\Psi = \frac{\varkappa^2}{l_0^2}\left(-1+|\Psi|^2\right)\Psi, \qquad (1)$$

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ACCESSION NR: AP4009374

$$\mathrm{rot\,rot}\,A = \frac{1}{\delta_0^2}\left\{\frac{\hbar c}{2e^*}(\Psi^*\nabla\Psi - \Psi\nabla\Psi^*) - |\Psi|^2 A\right\}. \quad (2)$$

Here $e^* = 2e$ is the charge of the Cooper pairs ($e > 0$), $\varkappa$ is the characteristic parameter of the Ginzburg-Landau theory, δ_0 is the penetration depth of a weak field into a massive superconductor, A is the vector potential of the magnetic field and $2\pi h$ is Planck's constant. Introducing cylindrical coordinates r, z, ϕ and considering that in the case of a hollow cylinder $\Psi = |\Psi| e^{-in\varphi}$ where n is an integer, the field equations (2) are written

$$\frac{d}{dr}\left[\frac{1}{r}\frac{d}{dr}(rA_\varphi)\right] = \frac{1}{\delta_0^2}\left(A_\varphi - \frac{\hbar cn}{2er}\right)|\Psi|^2, \quad (3)$$

$$\frac{1}{r}\frac{d}{dr}\left[r\frac{dA_z}{dr}\right] = \frac{1}{\delta_0^2}|\Psi|^2 A_z. \quad (4)$$

Here A_ϕ and A_z are the corresponding components of the vector potential, and

$$H_\varphi = -\partial A_z/\partial z, \quad H_z = r^{-1}\partial(rA_\varphi)/\partial r. \quad (5)$$

Equations (3), (4) must be solved under the conditions

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$$
\begin{gathered}
-H_\varphi|_{r=r_2} = H_I = 2I/cr_2, \quad H_\varphi|_{r=r_1} = 0, \\
H_z|_{r=r_2} = H_0, \quad H_z|_{r=r_1} = H_1.
\end{gathered} \tag{6}
$$

Here H_I is the field strength created by the current I on the exterior surface of the cylinder, H_0 is the external applied field, H_1 is the field in the interior cavity of the cylinder, r_1 is the radius of the interior cavity and r_2 is the radius of the exterior generating cylinder. Orig. art. has: 29 formulas.

ASSOCIATION: Fizicheskiy institut im P. N. Lebedeva AN SSSR (Physical Institute AN SSSR)

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Card 3/3

ZHARKOV, G.F. (Moskva)

Lenin Prizes of 1963 in the field of physics. Fiz. v shkole 23 no.3:19-21 My-Je '63. (MIRA 16:12)

ZHARKOV, G.F.; KROKHIN, O.N.

Summer schools of physics in France and Italy. Vest. AN SSSR 33 no.11:111-113 N '63. (MIRA 17:1)

L 13840-63 FCS(f)/EWT(1)/BDS/EEC(b)-2 AFFTC/ASD/ESD-3 GG/K/JXT(IJP)
IJP(C)
ACCESSION NR: AP3003148 S/0056/63/044/006/2122/2130

AUTHOR: Hsu, Lung-tao; Zharkov, G. F. 63

TITLE: Hollow superconductors in a magnetic field 62

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 2122-2130

TOPIC TAGS: hollow superconductors, superconducting spheres and cylinders, critical magnetic fields, magnetic moments, destruction of superconductivity

ABSTRACT: Formulas are described, within the framework of the Ginzburg-Landau theory of superconductivity, for the behavior of a hollow superconducting sphere or hollow cylinder in a magnetic field. While the problem of a hollow superconducting cylinder with the field parallel to the surface was solved by V. L. Ginzburg (ZhETF 42, 299, 1962), it is solved here for a field perpendicular to the surface. Expressions are also derived for the magnetic moments of hollow superconductors. The limits of possible superheating or supercooling are determined. Destruction of superconductivity of hollow cylinders or spheres by a field and by a current is also considered. The essential differences between curved and plane films are discussed. "In conclusion, we thank V. L. Ginzburg for his interest in the work and useful discussions." Orig. art. has: 39formulas.

Card 1/2 ASSOCIATION: Physics Inst. Academy of Sciences

SUTIN, I.A.; ZHARKOV, G.F.

Methodology of typing enteroviruses. Lab. delo 10 no.4:240-242 '64. (MIRA 17:5)

1. Virusologicheskaya laboratoriya Volgogradskoy oblastnoy sanitarno-epidemiologicheskoy stantsii.

ZHARKOV, G.F.

Emission of π-mesons and the beta decay of a proton moving in a magnetic field. IAd. fiz. 1 no.1:173-182 Ja '65. (MIRA 18:7)

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